Report for 2005RI32B: Development of a Statewide Public Water-Supply GIS Coverage for Rhode Island

Publications

- Water Resources Research Institute Reports:
  - Veeger, A., 2006, Development of a Statewide Public Water-Supply GIS Coverage for Rhode Island, Rhode Island Water Resources Center, University of Rhode Island, Kingston, RI.

Report Follows

Introduction

The State of Rhode Island requires accurate water-supply infrastructure data for effective development of State Guide Plan elements and planning associated with development of state and local land-use plans, emergency drought response, emergency interconnections and supplemental water investigations. A key element of the water supply infrastructure is the spatial distribution of public water-supply lines and service areas. Although spatial data exist for the 32 individual water-supplier service areas, there is no current unified statewide spatial inventory of these service areas and the existing attribute tables vary between the different datasets. The absence of a unified spatial dataset limits the ability of State agencies (i.e. Rhode Island Water Resources Board RIWRB, Department of Health) to accurately catalog the water-supply infrastructure and develop/address planning elements related to public water supply.

Nature, scope, and objectives of the project including a timeline of activities.

This project addresses this need by assembling the existing supplier-specific water line and service area spatial datasets into a unified statewide geographic information system (GIS) coverage. Establishing this unified GIS provides the State with a tool it needs to analyze and plan at a variety of scales such as individual water supplier, town, watershed, county or statewide. In particular, the updated coverages and maps proposed in this project will assist the Rhode Island Water Resources Board's (RIWRB) Water Allocation program and local technical assistance to water suppliers, planners and municipal officials relating water supply information to watershed capacity.

The objectives of the project are:

- Compilation of the existing water-supply service area spatial coverages.
- Unification of individual coverages into an internally consistent state-wide spatial dataset.
- Development of maps for technical assistance to state/town officials and for outreach and public education.

This project builds on work previously completed under a Joint Mapping Project between the RIWRB and the RIDOT as well as more detailed work underway on distribution capacities with Maguire Group for a supplemental water supply study. This two-phased study identifies supplemental water supply available for emergencies. As part of the project Maguire will produce new 1:5000 scale water line datasets for each of the 32 public water suppliers in Rhode Island by late January to mid February. The creation of a statewide water line GIS dataset and a statewide water district GIS dataset, are however beyond the scope of that mapping project. The work proposed herein, therefore builds upon and expands the efforts of the previous projects.

Methods

Compilation of existing water-supply service area coverages/shape files and

tabulation of data elements (attributes) present in each coverage - A compilation of the existing public supply spatial data coverages was obtained from Mary Hutchinson (Mapping and Planning Services, Jamestown, RI) a sub-contractor to the RI WRB.

Creation of individual water services areas - A 1000-ft buffer distance, as stipulated by the RIWRB, was generated to reflect approximate water district service areas based on the new 1:5000 scale water line datasets.

Creation and quality control analysis of unified spatial dataset and development of maps – Using the inventory of attributes as a guide, a new attribute table structure was created for the unified dataset. Data from the 32 individual datasets was merged into a unified dataset. The resulting merged product was verified against the original individual datasets to ensure that data integrity was preserved. This unified coverage was used to generate a State-wide map of the public water-supply infrastructure.

Metadata file to document all sources of information used in the unified dataset and create fact sheets – A metadata file consistent with RIGIS standards was prepared.

Results

The results of the project include:

GIS Coverage

A statewide public water-supply spatial dataset formatted for ArcGIS. This spatial data coverage will reside with the RI Water Resources Board and be made available on an as-needed basis to State and local agencies for planning purposes.

The coverage includes the distribution lines and a 1000-ft buffer designating the approximate service area for each of the 32 pubic water suppliers in RI (Table 1).

Table 1. Public water suppliers in Rhode Island.

Block Island Water Works	North Tiverton Fire District
Bristol County Water Authority	Pawtucket Water Supply Board
Cumberland Water Department	Portsmouth Water District
East Providence Public Works	Providence Water Supply Board
East Smithfield Water District	Richmond Water Supply System
Greenville Water District	RI Economic Development Corp.
Harrisville Fire District	Smithfield Water Supply Board
Jamestown Water Division	South Kingstown Water Department
Johnston Water Control Facility	Stone Bridge Fire District
Kent County Water Authority	Tiverton
Kingston Water District	United Water Rhode Island
Lincoln Water Commission	URI Facilities & Operation
Narragansett Water Department	Warwick Water Department
Newport Water Works	Westerly Water Department
North Kingstown Water Department	Woonsocket Public Works
North Smithfield Water Department	Zamborano Memorial Hospital

State Map

A map (also available in PDF format) was also produced to show the distribution network and buffered areas for each public water supplier (Figure 1).

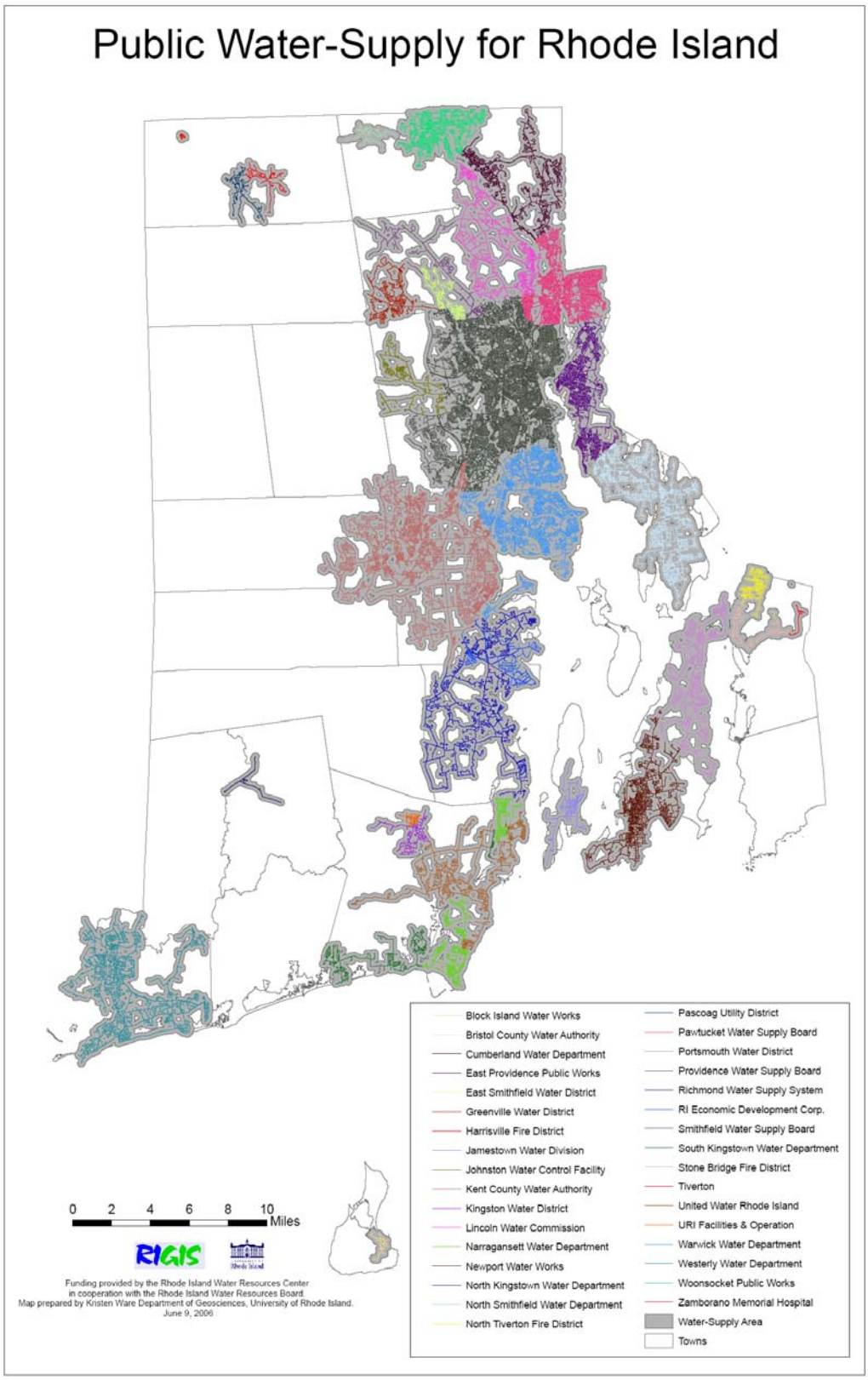

Figure 1. Public water supply areas in Rhode Island.